

Photos: K. Turner

Monitoring the impact of the Crofton weed rust fungus [1]

The easiest approach to monitor the long-term impact of the fungus on Crofton weed is to identify a suitable photo-point at the release site and take photos at the time of release and in subsequent years. The photo-point can be marked with a post or indicated in some other ways so that successive photos of the same area are taken.

The photo-point should not be obstructed by tree growth in the future and ideally the photo should be taken from south to north to minimise shading. The photo taken should preferably have a permanent feature in it, such as a distinct tree, to help future comparison between photos.

Details on photo monitoring are included below.

[1] **Disclaimer**: It is your responsibility to meet the terms of any weed control compliance order imposed by the relevant authority on the site selected for a biological control release. If applicable please check with the relevant authority to ensure that you have permission to quarantine the crofton weed rust fungus release area from other control programs. A biological control release cannot be used as an excuse not to control crofton weed or other weeds on the rest of the property. There is no guarantee that the rust fungus will establish and have an impact at your release site, as epidemics are regulated by prevailing environmental conditions. Participants must be aware that biological control is not a 'silver bullet' but rather a long-term strategy with potential to complement existing control techniques.

Photo monitoring

(Information modified from the *Guide to Monitoring Ecological Restoration Projects* of the NSW Environmental Trust: https://www.environment.nsw.gov.au/resources/grants/150472-EcologicalMonitoring.pdf)

Photo monitoring is a quick and relatively easy way of measuring change in the natural environment. A series of photos are taken from a fixed location at regular intervals with the aim of visually showing improvement in vegetation condition.

How to establish and maintain photo-points

Step 1: Choose your location

Your photo-points will stay the same over years, so you should select fixed locations from across your sites which clearly demonstrate the management issues being addressed through your project activities.

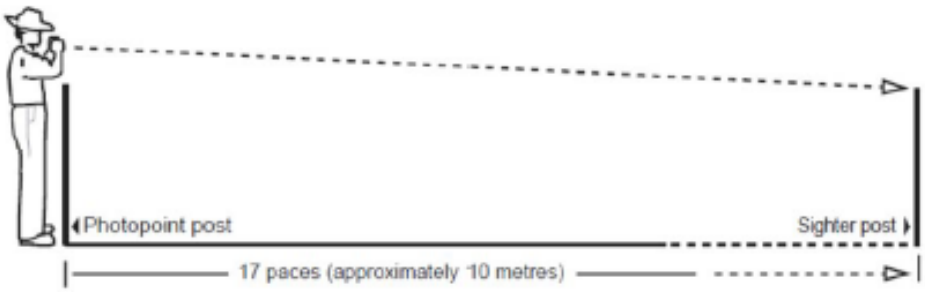
TIPS

• Consider proximity to tracks or roads for future accessibility.

• Consider potential vegetation regrowth that may obscure the clarity of future photos taken from the same location.

Step 2: Mark the location

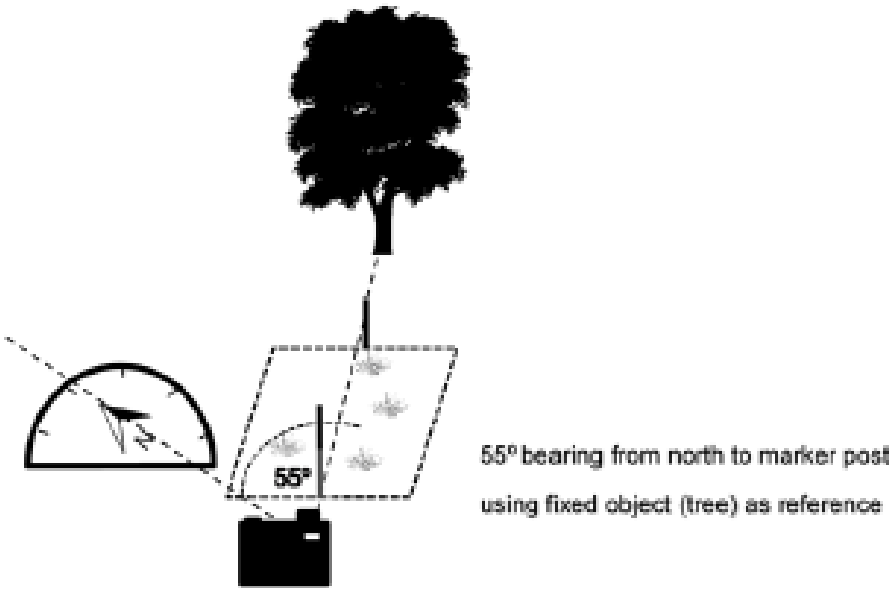
Install a physical marker (e.g. star-picket, tomato stake, etc.) to mark the point from which a photo will be taken. Then add a sighter post at a set distance (see diagram below). Attach flagging tape with information including a site reference number, date and aspect. Sites can change significantly following remediation work so this will help with finding the same location at a later stage. Capturing a GPS point using a handheld GPS or smart phone is also a handy method of retracing the approximate location of a photo-point and is highly recommended.



Source: Grodecki & Van Willing, 2010

Step 3: Take the photo

While standing at your marker post, use a compass to take bearing from due north to the centre of your photo frame (see diagram below). Take a few shots from the marker post (select the best/clearest shot later). If taking multiple images as part of a panorama, record bearings from north for each image and take sequential photographs (from either left to right or right to left) allowing for each image to overlap so that no gaps exist in the panorama.



TIPS

• Try to include a fixed reference object such as a distinctive tree, fence-post etc. in the photo for future reference.

• Consider taking a mix of photos which show your site at a broad scale (landscape). Use the same digital camera and settings (e.g. zoom, light settings, etc.) on the each time you take photos.

• Take along copies of the original photos for reference when returning to the photo-points to help match the field of view contents.

• Light cloudy days are ideal when sunlight is weaker and shadows from vegetation are less pronounced.

• Avoid taking photos during mist, when dark clouds are passing over or when vegetation/landscape are in mountain shadows.

Step 4: Record field data

It is important to record notes when you take each photo which will later help to explain what is being shown in the photo. Record all information relevant to your photos in a field notebook immediately after each photograph is taken. This can be transferred into your master photo monitoring data recording table file prepared for each site. Accurate field notes are a back-up to e-files in case photo file names are labelled incorrectly or become mixed up. Information for collection includes the site and station identification numbers, bearing, date, time, season and image number (from camera).

Step 5: Repeat

Photo monitoring is most effective when images are captured using a recurring timeframe. It is essential that monitoring stations are established pre- or at time of release of the biocontrol agent (baseline). The second photograph should ideally be taken within a year of the release. Follow-up photos should then be taken annually within a week of the anniversary of the second photograph (first year) at a minimum. You can choose to take additional photographs at the same station on a seasonal basis (i.e. summer; autumn; winter, spring) or on a six monthly basis. Take care to repeat and follow the directions outlined in Steps 3 and 4, being mindful that the same field of view inclusive of the original bearing and reference points are maintained.

Example of photo-point:

YEAR 1 (10/06/2014) – release of the fungus

Year 2 (02/07/2015) – 1-year post-release visit

Mt Keira